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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/548,637
Filing Date: April 13, 2000
Appellant(s): KOZA ET AL.

Kevin G. Shao
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 7-12-2011 appealing from the Office action mailed 1-12-2011.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 1-6, 13 and 15-23.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

5867397	Koza et al	2-1999

Appellant's admitted prior art (APA, specification pgs. 8-9)

Appellant's description of another APA (Ullman, J.R, specification pg. 94)

Beasley et al ("An overview of Genetic Algorithms: Part 2, Research Topics" 1993)

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-6, 13 and 15-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Appellant's admitted prior art (APA), in view of another APA Koza et al (US 5867397), Appellant's description of another APA (Ullman, J.R), and Beasley et al ("An overview of Genetic Algorithms: Part 2, Research Topics" 1993).

Note: Appellant's own spec is relied upon for the following claims limitations. In particular, the following limitations are included in the "background of the invention" section of the spec, therefore are considered well known and admitted prior art (APA).

Furthermore, **the general approach of genetic programming** as described in spec pg. 9 serves as the foundation of the rejection (i.e. Main reference).

Claims 1, 22-23:

1. Determining the scope and contents of the prior art.

Claims 1, 22-23:	**Prior arts**
1. (Currently Amended) A computer-implemented process for creating an entity:	**APA.** See e.g. pg. 9, L1, 11-12 which teaches that the feature of *automatically creating design using genetic programming* is known.
initializing a plurality of candidate entities and an	**APA.** See e.g. pg. 9, L3-5 which

iteration count with a predetermined value by supplying, from an external source, at least one candidate entity partially satisfying the predetermined design requirement which includes a characteristic of the reference structure to the initialized plurality of candidate entities, **Examiner Note (EN):** Drawn to *expert* initialization of designs.	teaches that the feature of *random initialization and iterative process* is known. **APA.** See also e.g. pg. 8, L9-10 which teaches that the feature of *expert initialization* is known. **Beasley.** See e.g. section 13.
wherein each candidate entity is represented by a tree structure having a plurality of nodes representing a structure of the candidate entity; **EN:** Drawn to tree structure.	**APA.** See e.g. pg. 6, L20 which teaches that the feature of *tree structure* is known.
performing iterative genetic programming operations, each iteration including:	**APA.** See e.g. pg. 9, L3-5 which teaches that the feature of *iterative process* of genetic programming is known.
creating a description of the structure for each of the candidate entities based on its tree structure, analyzing behavior and characteristics based on the description of the structure	**APA.** See e.g. pg. 6 Line 20 which teaches that the feature of *tree structure* is known.

of each candidate entity, including a simulation of the structure, **EN:** drawn to tree structure creation and simulation of behavior	**APA.** See also e.g. pg. 9, L3-5 that *design creating and evaluation of behavior* are known. **Koza.** See e.g. C50 Line 31-49 especially where it states "A *netlist describing* the circuit is then created ….Each circuit is then *simulated* to determine its behavior."
comparing each of the plurality of candidate entities with the reference structure based on the analysis of the behavior and characteristics to obtain an isomorphism value for each candidate entity, the isomorphism value representing a dissimilarity between the respective candidate entity and the reference structure, **EN:** drawn to comparing similarity using isomorphism value	**Ullman.** See e.g. pg. 94 L2-3 of Appellant's spec that applicant described subgraph isomorphism algorithm is known and taught by Ullman.
determining a fitness value for each of the candidate	**APA.** See e.g. pg. 9, L3-5 which

entities based on a compliance with the predetermined design requirement and the isomorphism value of the respective candidate entity, **EN:** drawn to fitness measure using isomorphism value	teaches that the feature of measuring *fitness value of each design* is known. **Ullman.** See e.g. pg. 94 L2-3 of Appellant's spec that applicant described fitness determination using isomorphism algorithm is known.
selecting at least one candidate entity from the plurality of candidate entities that has a fitness value exceeds a predetermined threshold,	**APA.** See e.g. pg. 9, L9-11 which teaches that the feature of *selecting designs based on fitness* is known
creating at least one new candidate entity by creating a variation in the selected at least one candidate entity if the selected at least one candidate does not satisfy the predetermined design requirement or a number of iterations has not reached the predetermined value of the iteration count, including performing one of a reproduction operation, offspring <u>crossover operation, mutation operation, and an architecture altering operation on</u>	**APA.** See e.g. pg. 9-10 which teach that the features of *reproduction, crossover, mutation, architecture-altering operations are* known.

the at least one selected candidate" **EN:** drawn to creating new population	
terminating the iterations if the selected at least one candidate satisfies the predetermined design requirement or a number of iterations has reached the predetermined value of the iteration count, wherein at least one of the selected candidate entities is used to design an end-result structure in view of the predetermined design requirement, and	**APA.** See e.g. pg. 9, L6 which teaches that the feature of *termination criterion* is known
updating the iteration count at the end of each iteration.	**EN: *inherent.*** The iteration count *must* be updated at the end of each iteration; Otherwise, the iterative process will never stop.

2. Ascertaining the differences between the prior art and the claims at issue.

While creating design is known, APA fails to teaches that “the design satisfies a predetermined design requirement that at least one characteristic is not in a reference structure” as claimed. Hence, the difference is creating *a design* versus *a new (patentable) design*.

While tree structure representation is known, APA fails to explicitly teach simulation of behavior. Hence, the difference is an extra step of simulation of tree structure.

While *expert initialization* is known, APA as described in spec pg. 9 uses *random initialization*. Hence, the difference is *expert initialization* versus *random*.

While *isomorphism algorithm* is known, APA as described in spec pg. 9 fails to teach using such specific algorithm to determine similarly of designs. Hence, the difference is why and how one of ordinary skilled in the art would have modified the APA to use isomorphism algorithm for similarity comparison.

3. Resolving the level of ordinary skill in the pertinent art.

(Objective Evidence) OE1: One of ordinary skill in the art would have recognized that the only difference in "creating a design" to "creating a *novel design*" is adding one more constraint to the multi-objective function. Such constraint is, of course, requiring the designed satisfies a predetermined design requirement that at least one characteristic is not in a reference (patented) structure. The Examiner contends that such knowledge is a common sense to one of ordinary skills in the art.

Furthermore, since Koza ('397) teaches automated design of complex structures using genetic programming (See e.g. Appellant's spec pg. 11 L16-20), and automatically creating the topology and sizing for the design using high level statement (See e.g. Appellant's spec pg. 11 L16-20), one skilled in the art would know how to add another constraint using high level statement in creating "novel design".

OE2: One of ordinary skill in the art would also know that simulation of structure is well known in the art (See e.g. Koza C50 Line 31-49). One of ordinary skill in the art would also know that the behavior of each developed structure can be determinate by simulation or observation (See e.g. Koza DETX(17)).

OE3: One of ordinary skill in the art would also know that Isomorphism value and/or isomorphism algorithm as disclosed by Ullman (an APA), is a well known method that can be used to represent similarity/dissimilarity between candidate entity and reference entity (See e.g. Appellant's description of Ullman in spec pg. 94).

OE4: One of ordinary skill in the art would also know that initial population can be initialized in two ways: random or expert guided. The applicant also teaches both approaches (See e.g. Appellant's spec pgs 8-9). Beasley also made it clear why one skill in the art would use domain knowledge in initializing GA population. See screenshot above that domain knowledge allows more efficient exploration of the search space.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

In view of OE1, one of ordinary skill in the art whom is aware of "novel design" would immediately motivated to added another constraint to the objective function (written in high level statement) or fitness measure in attempted to create a "novel design" However, merely having the motivation to do so does not automatically mean it could be done. To address this problem, one would have to incorporate a reference

structure and be able to tell the similarity/dissimilarity between candidate entity and reference entity. In order to do so, one would employ Isomorphism value and/or isomorphism algorithm, which is a well known method that can be used to compare similarity/dissimilarity between candidate entity and reference entity (In view of OE3). Therefore, one skill in the art would have and could have use isomorphism value to compare similarity/dissimilarity between candidate entity and reference entity with predictable result of creating a "novel design". It is applying known technique to known method ready for improvement. See *MPEP 2142.*

In view of OE2, one of ordinary skill would have and could have further modified the already modified APA (that uses isomorphism algorithm in creating novel design) by further incorporating simulation of structure. One skill in the art would have and could have because of the advantages of simulation, such as determining fitness without actually constructing the structure, and simulation has been widely applied. It is an instance of applying a known technique to a known device (method, or product) ready for improvement to yield predictable results. See *MPEP 2142.*

In view of OE4, one of ordinary skill would have and could have further modified the already modified APA (that uses isomorphism algorithm in creating novel design and simulation of structure) by further incorporating domain knowledge initialization of population with predicted benefits of allows more efficient exploration of the search space. It is applying a known technique to a known device (method, or product) ready for improvement to yield predictable results. See *MPEP 2142.*

Note: Appellant's own spec is relied upon for the following dependent claims. In particular, the following limitations are included in the " background of the invention" section of the spec, therefore are well known and admitted prior art.

Claim 2: (See e.g. Appellant's own spec at pg. 9, L15 which teaches that the feature of mutation is known).

Claim 3: (See e.g. Appellant's own spec at pg. 2 which teaches that the feature of simulating annealing is known).

Claim 4: (See e.g. Appellant's own spec at pg. 2 which teaches that the feature of hill climbing is known).

Claim 5: (See e.g. Appellant's own spec at pg. 9 which teaches that the feature of population is known).

Claim 6: (See e.g. Appellant's own spec at pg. 9, L13 which teaches that the feature of crossover is known).

Claim 13: (See e.g. Appellant's own spec at pg. 9, L3 which teaches that the feature of random process is known).

Claim 15: (See e.g. Appellant's own spec at pg. 37, lines 7-9, which teaches that the feature of simulation is known).

Claim 16: (See e.g. Appellant's own spec at pg. 37, lines 13-15, which teaches that the feature of avoiding simulation is known).

Claim 17: (See e.g. Appellant's own spec at pg. 16, L15-17 on constrained syntactic structure is known).

Claim 18: (See e.g. Appellant's own spec at pg. 11, L16-20 and pg. 12, L10-20 which teaches that the feature of electrical circuit is known).

Claim 19: (See e.g. Appellant's own spec at pg. 11, L21 and pg. 12, L4 which teaches that the feature of controller is known).

Claim 20: (See e.g. Appellant's own spec at pg. 12, L4-6 and pg. 13, L3-7 which teaches that the feature of antenna is known).

Claim 21: a mechanical system is obvious over circuit, controller, and antenna. It is merely a simple substitution of one known, equivalent element for another to obtain predictable result. I.e. one can evolve a mechanical system using the same method that evolves circuit, controller and antenna. The only difference is substituting electrical component with mechanical component.

(10) Response to Argument

In re pg. 10, appellant argues

> Examiner contends that lines 1 and 11-12 of page 9 of the alleged APA discloses such a limitation (1/12/2011 Office Action, page 3). Appellant respectfully disagrees.
>
> Although the cited section of the alleged APA discusses that iterative genetic programming techniques in general can be utilized to create a structure, however, the cited section of the alleged APA fails to specifically disclose that the genetic programming techniques can be utilized to create a structure that can satisfy a design requirement in which at least one characteristic is not found in a reference structure. There is no disclosure or suggestion within the alleged APA for such a limitation.

In response, the Examiner agrees that the general approach of genetic program as descibed in appeallant's specification can be used to create a structure, but fails to teach creating a novel structure.

However, the Examiner respectfully points out that it is the ***modified*** teaching of APA that teaches the claimed limitations. Detail responses are presented below.

In re pg. 10, appellant argues

> Although the Examiner acknowledges that the alleged APA fails to disclose the above limitation, the Examiner contends that such a limitation would be obvious to an ordinary skill in the art (1/12/2011 Office Action, pages 7-10). Appellant respectfully disagrees.
>
> In order to render a claim obvious, each and every limitations of the claim must be taught by the cited references. As discussed above, there is no disclosure or suggestion of the above limitation within the alleged APA, Koza, Ullmann, and Beasley. The Examiner mainly relies on the alleged obviousness from one with ordinary skill in the art without providing concrete evidence and thus fails to establish a prima facie case of the obviousness rejection.

In response, the Examiner agrees that none of the APA, Koza, Ullmann and Beasley explicilty disclosed creating a novel structure.

However, the Examiner respectfully points out that it is the ***modified*** teaching of APA that teaches the claimed limitations.

Appeallant argues there is no concrete evidence. The Examiner respectfully disagrees.

In particular, as set forth in 1/12/2011, pg. 7-10, the Examiner presented an objective evdience based on well recognized knowledge (put differently, a common sense). Specifically, the Examiner asserts that it is a **common sense** to one ordinary skill in the art or someone whom is aware of patenting that creating novel design requires at least one characteristic is not in a reference structure (i.e. patented structure). Such knowledge or common sense is well recognized by *some if not all* patent practitioners/inventors; otherwise, there is no way to determine whether a design is novel or not, and the patent system would be meaningless.

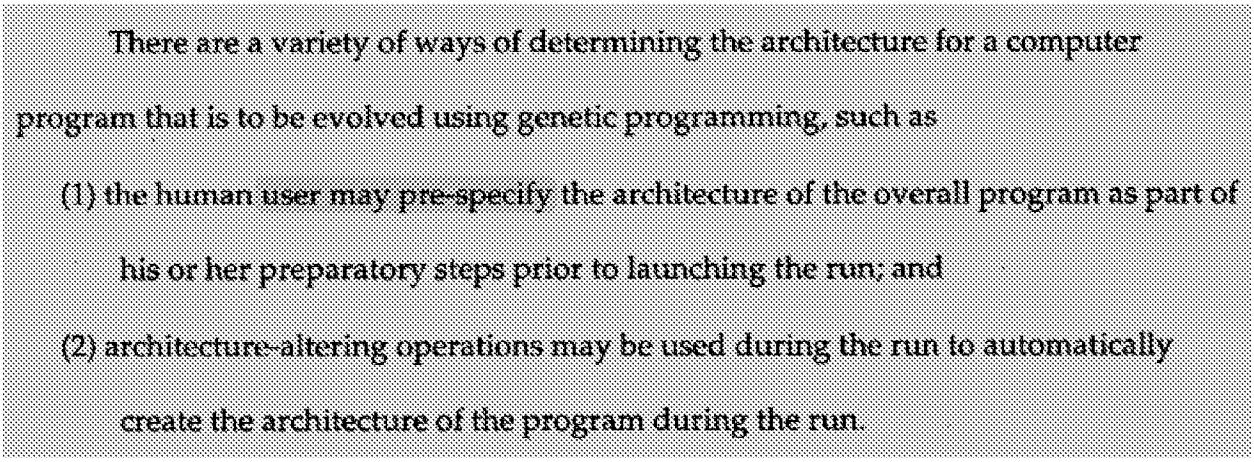
Therefore, the Examiner asserts that in view of such well recongized knoweldge or common sense, it would have been obvious to one of ordinary skill in the art to modify the general approaches of APA to achive a predictable result of creating novel desing that satisfies a predetermined design requirement that at least one characteristic is not in a reference structure.

In re pg. 10, appellant argues

> In addition, independent claim 1 requires initializing candidate entities and an iteration count with a predetermined value by supplying, from an external source, where at least one candidate entity partially satisfies the predetermined design requirement which includes a characteristic of the reference structure to the initialized candidate entities. It is respectfully submitted that such a limitation is also absent from the combination of alleged APA, Koza, Ullmann, and Beasley.

In response, the Examiner respectfully disagrees and points out that:

1) Appeallant's spec disclosed that *expert initialization* is known in the art. See screenshot below.

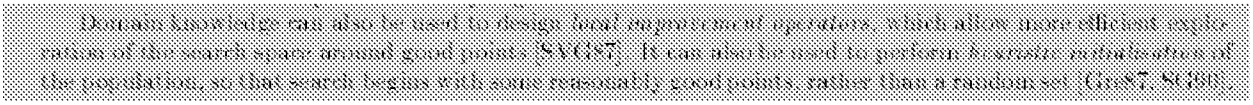


There are a variety of ways of determining the architecture for a computer program that is to be evolved using genetic programming, such as

(1) the human user may pre-specify the architecture of the overall program as part of his or her preparatory steps prior to launching the run; and

(2) architecture-altering operations may be used during the run to automatically create the architecture of the program during the run.

2) **Beasley** also disclosed domain knowledge can also be used to design local improvement operators which allow more efficient exploration of the search space around good points. It can also be used to perform heuristic *initialization* of the population so that search begins with some *reasonably good points* rather than a random set. See e.g. section 13 or screenshot below. **EN:** those good points (designs) are points "partially satisfying" some design requirement (characteristic).



3) therefore, expert initialization is **at least** disclosed by the appellant as a known method; and also disclosed by Beasley.

4) Hence, appeallant's argument seems unsupported. Detail responses are presented below.

In re pg. 11, appellant argues

> The Examiner contends that lines 9-10 of page 8 and lines 3-5 of page 9 of the alleged APA disclose such a limitation (Office Action, pages 3-4). Appellant respectfully disagrees.
>
> It is submitted that the cited section of the alleged APA only discloses randomly initializing candidate entities. The cited section of the alleged APA fails to disclose or suggest initializing candidate entities in which at least one candidate entity partially satisfies the predetermined design requirement which includes a characteristic of the reference structure to the initialized candidate entities.

In response, the Examiner respectfully disagrees. Screenshot of cited section of Appeallant's spec (lines 9-10 of page 8) is provided below.

> There are a variety of ways of determining the architecture for a computer program that is to be evolved using genetic programming, such as
>
> (1) the human user may pre-specify the architecture of the overall program as part of his or her preparatory steps prior to launching the run; and
>
> (2) architecture-altering operations may be used during the run to automatically create the architecture of the program during the run.

It is respectfully submitted that cited section of APA does not disclose *randomly* initializing candidate entities as argued. To the contrary, the cited section of APA disclose human (expert) pre-specifying candidate entities; therefore disclosed and suggested expert initiallization.

In re pg. 11, appellant argues

> As explained in the specification of the present application, "a human designer may find it advantageous to apply his or her domain knowledge of a particular field to create the initial circuit for a particular problem. Such knowledge would bias the search for a satisfactory design in the direction of a particular known or desirable characteristic." See e.g., page 53, lines 11-16 of specification of the present application ("Specification"). An initial entity "is often a seeded (primed) individual that is believed to be reasonably good." See e.g., page 42, lines 3-4 of the Specification.

In response, the Examiner agrees.

1) Indeed, the advantage of expert initialization is to start with seeded (primed) individual(s) that is/are believed to be reasonably good. Such knowledge is well recognized in one of ordinary skill in the art (for example, Beasley). Appellant also indicated in spec (lines 9-10 of page 8) that such method (i.e. expert initalization) is known.

2) Referring back to response above, it is believe that appeallant's argument is misplaced because appellant's spec (lines 9-10 of page 8) teaches expert initialization, not random initialization as aruged.

In re pg. 11, appellant argues

> The initial random population in the alleged APA does not include "at least one candidate entity partially satisfying the predetermined design requirement which includes a characteristic of the reference structure to the initialized plurality of candidate entities." There is no suggestion in the alleged APA to include characteristics of the reference structure during initialization. As such, the process of the present application is more efficient over the alleged APA because less iterations would be needed to derive a final candidate since the initialization already bias the process in a direction.

In response, the Examiner respectfully disagrees.

1) Indeed, the general approach (appeallant's spec pg. 9) relied upon uses random initailization.

2) However, as indicated in the office action (1/12/2011, pgs. 3-4), expert initailization is also known as APA, and also being disclosed by Beasley. The Examiner indiciated in office action (1/12/2011, pg. 8) that the general approach uses random initailization, not expert initiazation. The Examiner then presented objective evidence in office action (1/12/2011, pg. 9 on OE4) to estabish obviousness and presented evidence (1/12/2011, pg. 10 on OE4) as to why one of ordinary skill in the art would have modified the random initialization into expert initialization (and the benefit).

3) Appellant's seems to agree with Examiner's finding (see previous argument) that the advantage of expert initialization is to start with seeded (primed) individual(s) that is/are believed to be reasonably good (by including characteristic of the reference structure).

In re pg. 12, appellant argues

> Further, independent claim 1 requires creating a description of the structure for each of candidate entities based on its tree structure and analyzing behavior and characteristics based on the description of the structure. It is respectfully submitted that such a limitation is also absent from the alleged APA, Koza, Ullmann, and Beasley.

In response, the Examiner respectfully disagrees.

1) The Examiner indiciated in office action (1/12/2011, pg. 4) that tree sturcture is known. The Examiner indiciated in office action (1/12/2011, pg. 5) that analyzing behavior and characterisitc of tree sturcture is also known. Furthermore, simulation of tree is disclosed by Koza.

2) Therefore, tree structure is **at least** disclosed by the appellant as a known method; and also disclosed by Koza. The simulation (i.e. analyzing behavior and characterisitc of tree sturcture) is dislosed by Koza.

3) Hence, appeallant's argument seems unsupported. Detail responses are presented below.

In re pg. 12, appellant argues

> The Examiner contends that line 20 of page 6 and lines 3-5 of page 9 disclose the above limitation (1/12/2011 Office Action, pages 4-5). Appellant respectfully disagrees. The cited section of the alleged APA only discloses that genetic programming can be performed based on a tree structure. It is submitted that cited section of the alleged APA fails to disclose creating a description from the structure and analyzing behavior and characteristics based on the description.

It appears that the appeallant is arguing simulation step is not being disclosed in pg. 6 and 9 of the sepcication. The Examiner agrees that simulation is not disclosed pg. 6 and 9 of the sepcication. However, such limitation is disclosed by Koza (see office action (1/12/2011, pg. 5). Note: pg. 6 and 9 of the sepcication is relied upon to show that tree sturcture is known. The Examiner did not indicated in office action (1/12/2011, pgs. 4-5) that simulation is APA.

In re pg. 12, appellant argues

> Furthermore, independent claim 1 requires comparing each of the candidate entities with the reference structure based on the analysis of the behavior and characteristics to obtain an isomorphism value for each candidate entity, where the isomorphism value represents a dissimilarity between the respective candidate entity and the reference structure, and determining a fitness value for each of the candidate entities based on a compliance with the predetermined design requirement and the isomorphism value of the respective candidate entity. It is respectfully submitted that such a limitation is also absent from the alleged APA, Koza, Ullmann, and Beasley.

In response, the Examiner respectfully disagrees.

1) The Examiner indiciated in office action (1/12/2011, pg. 5) that isomorphism algorithm is known and taugh by Ullman. The Examiner also indiciated in office action (1/12/2011, pg. 8-9) why and how to apply the isomporhism algortihm of Ullman to achieve predictable result of using isomorphic value to determine similarity/dissimilarty between designs.

2) Therefore, isomorphism value is indeed disclosed by the Ullman. Detail responses are presented below.

In re pg. 12, appellant argues

> Specifically, the cited references fail to disclose deriving or suggesting an isomorphism value for each candidate entity based on the analysis of the behavior and characteristics and determining a fitness value based on at least the isomorphism value using genetic programming techniques.

In response, the Examiner agrees that the Ullman alone fails to explicitly teach comparing each of the plurality of candidate entities with the reference structure based on the analysis of the behavior and characteristics to obtain an isomorphism value for each candidate entity, the isomorphism value representing dissimilarity between the respective candidate entity and the reference structure.

However, the Examiner respectfully points out that it is the ***modified*** teaching of APA in view of Ullman and Koza that teaches the argued limitations.

Specifically, the Examiner indicated (1/12/2011, pg. 5) while *isomorphism algorithm* is known, it is not being explicitly disclosed to be used to determine similarly of designs. The Examiner then presented objective evidence (1/12/2011, pg. 9 OE3) that isomorphism value is a well known method used to repsent similarity/disimilarity. The Examiner also indicated (1/12/2011, pgs. 9-10) why and how to incorpate such well known method to modify the general approach of APA to reach a predicatable result of using isomorphism to measure similarity/disimilarity between designs.

The Examiner later brought in Koza for the simulation protion (1/12/2011, pg. 10) and indicated why/how to include simulation and use isomphorism to measure the simulated behavior (instead of actually constructing the sturcture).

Again, the Examiner repectfully submits that it is the ***modified*** teaching of APA that teaches the claimed limitations, not the indivdual reference alone.

In re pg. 13, appellant argues

> Although the Examiner acknowledges that Koza fails to disclose the above limitation, the Examiner contends that Ullmann discloses such a limitation (1/12/2011 Office Action, page 9). Appellant respectfully disagrees.
>
> Although Ullmann discloses a method using an isomorphism value, Ullmann does not disclose or suggest such a method can be used in genetic programming to design an entity structure. There is no suggestion within Ullmann to combine with Koza, or vice versa. In fact, there is no mention of Ullmann or the term of "isomorphism" in Koza. The fact that the present application references Ullmann and its isomorphism algorithm in the specification (see Specification, page 94) does not provide any motivation for one with ordinary skill in the art, based on the teachings of Ullmann and Koza, to combine Ullmann and Koza.

In response, the Examiner agrees that the Ullman alone fails to explicitly teach such method can be used in genetic programming to design an entity structure. The Examiner did acknowledge such difference (1/12/2011, pg. 8).

The Examiner also agrees that there is no suggestion within Ullman to combine with Koza, and neither in pg. 94 of specification .

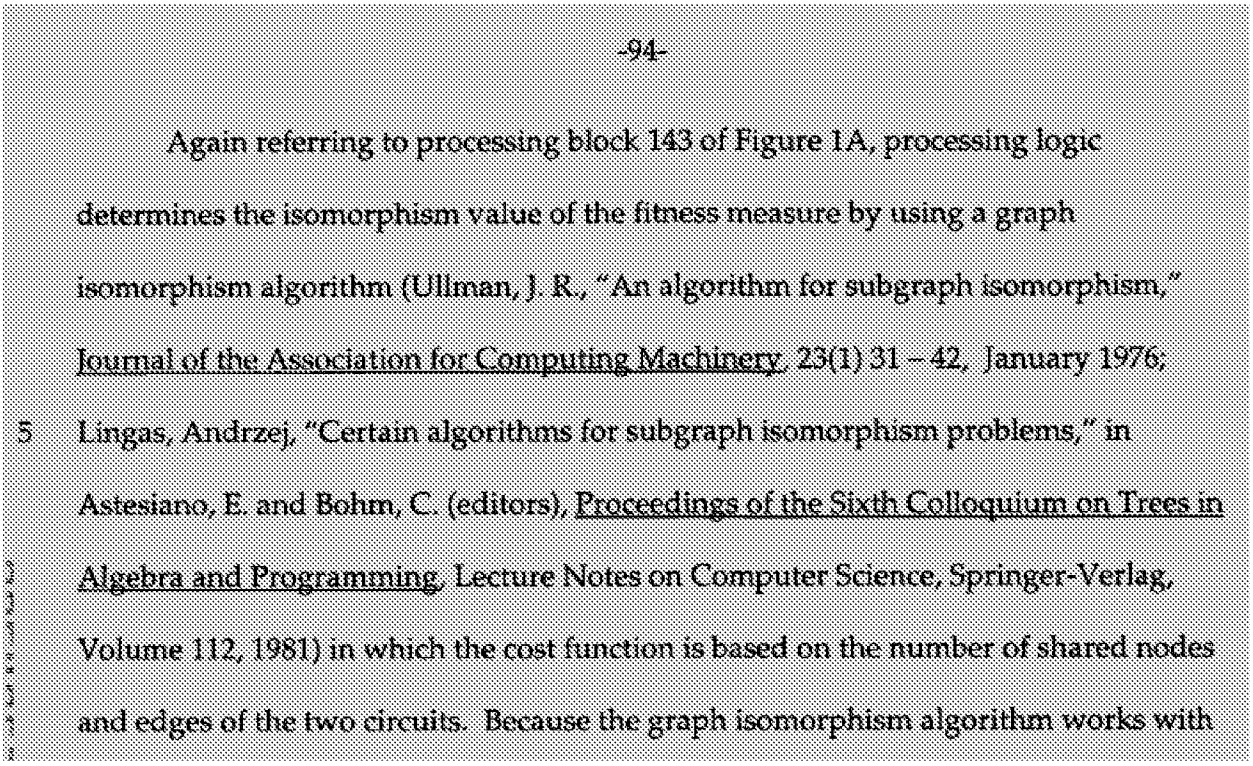
However, the Examiner respectfully points out that an objective evidence and motivation for employing Ullman's isomorphism algorithm is presented in office action (1/12/2011, pg. 8 OE1). Detail responses are presented below.

In re pg. 13, appellant argues

> In contrast, the only suggestion to utilize an isomorphism algorithm disclosed by Ullmann with the genetic programming techniques can be found on page 94 of the Specification of the present application. Therefore, the Examiner can only combine these two references based on the specification of the present application (e.g., based on the impermissible hindsight of Applicant's own disclosure).

In response, the Examiner respectfully disagrees.

1) Screenshot of pg. 94 is reproduced below. It should be note that there is no motivation of combination being recited in pg. 94. Pg. 94 simply states the appeallant employs graph isomorphis alogrithm of Ullman to determine fittnes measure. Therefore the Examiner does not understand where the impremissible hindsight comes from.



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Again referring to processing block 143 of Figure 1A, processing logic determines the isomorphism value of the fitness measure by using a graph isomorphism algorithm (Ullman, J. R., "An algorithm for subgraph isomorphism," Journal of the Association for Computing Machinery, 23(1) 31 – 42, January 1976; Lingas, Andrzej, "Certain algorithms for subgraph isomorphism problems," in Astesiano, E. and Bohm, C. (editors), Proceedings of the Sixth Colloquium on Trees in Algebra and Programming, Lecture Notes on Computer Science, Springer-Verlag, Volume 112, 1981) in which the cost function is based on the number of shared nodes and edges of the two circuits. Because the graph isomorphism algorithm works with

2) Assuming *arguendo* that pg. 94 did provided a motivation to combine, the Examiner still respectuflly disagrees and points out that the motivation for combining Ullman is **different** from the appeallant. See office action (1/12/2011, pg. 9-10). Specifically, the Examiner indicated why isomorphism value is needed and how it can be used to create novel design by measure similarity/dissimilarty between designs.

3) As such, the Examiner respectfully submits that appeallant's arugement of impremissible hindsight is unsupported.

In re pg. 13, appellant argues

> Clearly, the Examiner fails to establish a prima facie case to combine the Koza with Ullmann, because there is absolutely nothing within both references to suggest a combination of both references. The Examiner can only assert such a combination based on the disclosure of Applicant's own disclosure. Therefore, it is respectfully submitted that, without Applicant's own disclosure, it is not obvious to one with ordinary skill in the art to combine these two references.

In response, the Examiner respectfully disagrees.

1) As explained above, there is no motivation of combination being recited in pg. 94.

2) The Examiner presented a motivation for combining Ullman based on necessaity and logical flow, not appeallent's specification. Such motivation is clearly **different** from the appeallant (if any).

In re pgs. 13-14, appellant argues

> Even if the Koza were combined with Ullmann, such a combination still lacks the limitations set forth above, particularly, using an isomorphism value to represent dissimilarity between two entities during iterative operations using genetic programming techniques. Again, any suggestion for combining the Koza and Ullmann can only be found based on the impermissible hindsight of Applicant's own disclosure.

In response, the Examiner respectfully disagrees.

1) Again, as explained above, there is no motivation of combining being recited in pg. 94. The Examiner also presented a motivation for combining Ullman based on necessaity and logical flow, not appeallent's specification. Such motivation is clearly **different** from the appeallant (if any).

In re pg. 14, appellant argues

> Although Beasley discloses an introduction of genetic algorithms, Beasley fails to disclose the specific limitations of genetic programming techniques set forth in independent claim 1. Independent claim 1 is not merely about genetic algorithms or genetic programming. Rather, independent claim 1 is about a specific way to design structures using genetic programming techniques.

In response, the Examiner respectfully disagrees.

1) Beasley discloses much more than what the appeallant argues. Nonetheless, the critual point is that Beasley teaches why/how to use expert initiallization instead of random initiallization.

2) Again, the Examiner cannot emphasis enough that it is the ***modified*** teaching of APA in view of Beasley, Koza, Ullman that teaches the claimed limitations, not the indivdual reference alone.

In re pg. 14, appellant argues

> Again, in order to render a claim obvious, each and every limitations of the claim must be taught by the cited references, individually or in combination. It is respectfully submitted that Koza, Ullmann, and Beasley, individually or in combination, fail to disclose or suggest each and every limitations of independent claim 1. Therefore, for reasons set forth above, it is respectfully submitted that independent claim 1 is patentable over the alleged APA, Koza, Ullmann, and Beasley.

In response, the Examiner respectfully disagrees and submits that it is the ***modified*** teaching of APA in view of Beasley, Koza, Ullman that teaches the claimed limitations, not the indivdual reference alone.

In re pg. 14, appellant argues

> Similarly, independent claims 22-23 include limitations similar to those recited in claim 1. Thus, for the reasons similar to those discussed above, independent claims 22-23 are patentable over the alleged APA, Koza, Ullmann, and Beasley. Given that the rest of the claims depend from one of the above independent claims, at least for the reasons similar to those discussed above, it is respectfully submitted that the rest of the claims are patentable over the alleged APA, Koza, Ullmann, and Beasley.

Similarly, the Examiner respectfully disagrees and submits that it is the ***modified*** teaching of APA in view of Beasley, Koza, Ullman that teaches the claims 22-23, not the indivdual reference alone.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Lut Wong/

Examiner, Art Unit 2129

Conferees:

/Kakali Chaki/

Supervisory Patent Examiner, Art Unit 2122

/JEFFREY A GAFFIN/

Supervisory Patent Examiner, Art Unit 2100